

June 6, 2013

William Murray, Ph.D., BCBA-D
Department of Health Services, Division of Long Term Care
Treatment Intervention Advisory Committee (TIAC)
1 West Wilson Street
P. O. Box 7851
Madison, Wisconsin 53707-7851

Re: Request to Submit Research Supporting Sensory Integration Therapy (SIT)

Dear Dr. Murray:

I am writing on behalf of the American Occupational Therapy Association (AOTA), which represents the interests of 140,000 occupational therapy professionals in the United States, including researchers, educators, and practitioners. AOTA appreciates the opportunity to submit research and information regarding the efficacy of sensory integration therapy (SIT) for review by the Division of Long Term Care's Treatment Intervention Advisory Committee (TIAC). AOTA supports the work of our members who provide occupational therapy interventions using a sensory integration approach. It is our belief that there is value in sensory integrative practices to enhance the lives of some individuals with disabilities such as autism spectrum disorder (ASD) and that emerging research is helping to validate its efficacy. We understand that the TIAC will be meeting on Friday, July 26, 2013 to discuss sensory integration therapy. We plan to attend the TIAC and we would be pleased to answer questions or provide additional information.

Request from Department of Health Services, Division of Long Term Care

The Wisconsin Occupational Therapy Association has been asked by the Wisconsin DHS Division of Long Term Care's Treatment Intervention Advisory Committee to review research on the efficacy of SIT for children with autism spectrum disorders (ASD). In response to this request, the American Occupational Therapy Association has provided the following information, which describes SIT, reviews the latest research on SIT's efficacy, and addresses the conclusions pertaining to SIT that are contained in comprehensive, national-level reviews of ASD treatments.

I. Description of sensory integration and sensory integration therapy

Sensory integration refers to the organization of multisensory input for perception and the ability to respond adaptively to environmental demands (Ayres, 1972; Ayres, 1975; Stein & Meredith, 1990; Wallace & Stein, 2007). Problems in the ability to effectively integrate sensation can limit a child's ability to attend to tasks, perform coordinated motor actions, plan and sequence novel tasks, develop social relationships, manage classroom demands, perform self-care tasks, or participate in family activities. When such problems interfere

with the child's participation in age-appropriate activities of daily life, occupational therapists use a wide range of approaches to help address these concerns.

Sensory integration therapy (SIT), as originally described by A. Jean Ayres (1975, 1979), represents a neuroscientifically based therapeutic approach for treating children with ASD. The aim of SIT is to promote the child's ability to organize increasingly complex, successful adaptive responses (Ayres, 1972). To be correctly labeled as SIT an intervention must meet the following criteria, as described in the Ayres Sensory Integration Fidelity Measure (Parham et al., 2007; Parham et al., 2011): (a) assurance of physical safety; (b) presentation of multi-modal sensory opportunities; (c) maintenance of appropriate levels of alertness; (d) challenge to postural, ocular, oral, or bilateral motor control; (e) challenge to praxis and organization of behavior; (f) therapist-child collaboration in activity choice; (g) tailoring of activity to present a "just-right" challenge; (h) assurance that the therapeutic activities successfully engage the child; (i) support of the child's intrinsic motivation to play; and (j) establishment of a therapeutic alliance. Moreover, SIT is based on a thorough assessment of the child's developmental abilities and sensory-related problems, is individualized in accord with the child's sensory modulation and integration difficulties, involves close monitoring to gauge the child's fluctuating responsiveness, and is periodically evaluated for its effect on the child's participation in school and home environments.

The American Occupational Therapy Association (AOTA) recognizes SIT as one of many treatment approaches used by occupational therapists working with children ASD. When providing SIT, the therapist may utilize sensory-based modalities (e.g., a pressure vest) or recommend specific sensory strategies, but unless these procedures are embedded in a multifaceted treatment plan that adheres to the above criteria (including the presentation of *multi-modal* sensory opportunities), the approach cannot appropriately be described as SIT. SIT is provided utilizing a direct one-on-one intervention model in a clinic environment that contains specialized equipment (e.g., suspended swings) capable of providing graduated and varied forms of multisensory input. Treatment sessions last approximately 30 minutes to one hour, one to three times per week. Ideally, SIT should be administered for a minimum of several weeks.

II. Latest and best research related to the efficacy of SIT for children with ASD

To date, five outcome studies have been conducted on ASD interventions that match the criteria of SIT. Of these five studies, four have demonstrated important positive effects (Case-Smith & Bryan, 1999; Linderman & Stewart, 1999; Pfeiffer et al., 2011; Schaaf et al., in press), and one did not find any effect (Watling & Dietz, 2007). If studies of interventions that included at least two of the essential components as stipulated on the Ayres Sensory Integration Fidelity Measure are also considered, two additional studies provide positive evidence (Fazlioglu & Baran, 2008; Thompson, 2011). Finally, a reasonable argument can be made to consider the findings of a further study (Smith et al., 2005) which tested the effectiveness of SIT on reducing self-stimulating behaviors in seven children diagnosed with pervasive developmental disorder and/or mental retardation. A summary of all eight studies mentioned above is presented in Table 1 and reveals that seven of the eight studies reported favorable results in one or more outcome domains.

In considering the entries in Table 1, the most recent evidence stems from a randomized controlled trial on the effectiveness of SIT for children with ASD which has just been accepted for publication, pending revisions, by the *Journal of Autism and Developmental Disorders* (Schaff et al., in press). This latter study included 32 children with ASD who were randomly assigned to either a 10-week sensory integration intervention or a usual care condition. Results show that SIT, relative to usual care, led to significantly higher scores on Goal Attainment Scales (primary outcome) and greater improvement in the areas of socialization and caregiver assistance in self-care. This pattern of positive RCT-based findings is further buttressed by several single-subject design studies that are contained in Table 1 (Case-Smith & Bryan, 1999; Linderman & Stewart, 1999; Smith et al., 2005), which also demonstrate favorable outcomes for SIT (e.g., improvements in mastery play, engaged behaviors, adult interactions, response to movement, reduction in self-stimulating behaviors).

III. Existing reviews of SIT from authoritative bodies

Several national reviews have attempted to analyze evidence regarding the effectiveness of different therapies for children with ASD in order to help consumers, health care providers, and policy makers make informed choices among treatment alternatives. Below, we discuss the evaluations of SIT contained in three major reviews: (a) the National Autism Center's National Standards Project report (NSP); (b) the Vanderbilt Evidence-Based Practice Center's Agency for Healthcare Research and Quality (AHRQ) report; and (c) a RAND Corporation report published in the journal *Pediatrics* (Maglione et al., 2012).

National Standards Project (2009).

In this report, the "sensory integrative package" is classified as an "unestablished" intervention (pp. 52-53) due to a putative lack of evidence for its efficacy. However, as a result of new evidence that has been published since 2007 (the NSP's cutoff point for including studies), it is incontrovertible that SIT does in fact now meet the criteria for "established" interventions. Specifically, on page 32 of the NSP report it is indicated that two or more group design studies with merit scores of 3 or greater, in the absence of any equally well-designed studies that produce null results or document adverse effects, are sufficient to classify an intervention as "established." In relation to this standard, recent randomized trials which demonstrate a positive effect for SIT (Pfeiffer et al., 2011) and a comprehensive, multisensory approach which includes most of the essential components of SIT (Fazlioglu & Baran, 2008) each meet the NSP criteria for a scientific merit rating scale score of 5 (comparison of at least two groups, each comprised of 10 or more research subjects, with random condition assignment and no data loss; NSP Report, p. 18). These two studies included 37 and 30 children with ASD, respectively, with random assignment to either a several-week sensory integration or comprehensive, multisensory intervention condition or a control condition. In each of these studies, both pre-tests and post-tests were undertaken and important benefits for the intervention groups were reported. Significant intervention effects included a reduction in sensory problems (Fazlioglu & Baran, 2008), diminished autistic mannerisms (Pfeiffer et al., 2011), and improvement in therapeutically identified goals in the areas of sensory processing, motor skills, and social functioning (Pfeiffer et al., 2011). It is noteworthy that these positive outcomes were not only statistically significant, but also tended to evidence a large magnitude of effect (with Cohen's *d* exceeding 1.0). *Therefore,*

based on these two studies alone, it is arguable that SIT should now be classified as an “established” intervention approach.

It is noteworthy that the “sensory integrative package” category, as identified in the NSP report, incorrectly includes studies that clearly fail to meet the definition of SIT (Fertel-Daly et al., 2001; Jung et al., 2006; Kane et al., 2004; Zissermann, 1992). In contrast to the classification procedure utilized in this report, evidence pertaining to interventions that involve an extremely limited number of sessions or that focus on a single type of sensory stimulus (e.g., a weighted vest or application of deep pressure) should not be used to evaluate SIT.

AHRQ (2011).

In this review, studies were excluded that were published prior to 2000 (or after the cutoff date of May 2010) or that had a total sample size of less than 10 participants. The authors classified SIT as having “insufficient evidence,” but, as was the case with the NSP report, if recent randomized controlled trials (Pfeiffer et al., 2011; Schaaf et al., 2013) had been included in the review, the SIT approach would have garnered a higher strength of evidence. Also, similar to the NSP report, certain studies which involved only a single sensory-related modality delivered in a virtual reality context (Jung et al., 2006a; Jung et al., 2006b) were misclassified as involving SIT. It is noteworthy that, in the AHRQ report, no current behavioral intervention for ASD was determined to have a high level of evidentiary support.

RAND Corporation (2012).

The RAND Corporation’s document presented evidence-based guideline statements developed by a Technical Expert Panel (TEP), with assistance from the Southern California Evidence-based Practice Center (based at the RAND Corporation) and faculty from the University of California at Los Angeles. The TEP was a large “blue ribbon” multidisciplinary group consisting of experts in fields such as psychology, developmental pediatrics, child psychiatry, and education. No treatment reviewed by the TEP was supported by evidence considered stronger than “moderate,” and the authors stated a need for large, well-designed controlled studies to be conducted in order for the interventions under review to reach a high level of evidentiary strength. Respective members of the TEP disagreed in their assessments of the strength of evidence for the effectiveness of SIT, and could not reach a consensus regarding this therapeutic approach.

IV. Summary and Conclusions

Of the eight studies included in Table 1, seven demonstrated positive effects; the remaining study (Watling & Dietz, 2007) was plagued by measurement and design issues.¹ Therefore,

¹ Problems with the Watling and Dietz study included: (a) ceiling or floor effects on the outcome assessments for 6 of the 8 individual analyses, which greatly reduced any opportunity to obtain positive results; (b) the use of a very small A2 observation window, with the possibility of intervention spillover effects spuriously enhancing performance during this second non-intervention phase; and (c) significant complications in the assessment of engagement (one of the two outcome measures). Moreover, the authors revealed that reports by caregivers and study personnel indicated that over the course of the SIT intervention period multiple new adaptive behaviors emerged for each of the treated children.

we conclude that a growing body of evidence underscores the efficacy of SIT as a viable option for treating children with ASD.

Although several prominent reports fail to regard SIT as an established evidence-based intervention, several concerns mitigate this negative conclusion. First, in most cases the reports are outdated, and the inclusion of more recent research studies would significantly elevate the evidential status of SIT. Second, the negative conclusions have been heavily influenced by nonsignificant results stemming from interventions that do not fit the definition of SIT. Such incorrect classifications may be related to the fact that the expert panels have in each instance failed to include occupational therapists, leading to disciplinary bias against SIT. Third, it is noteworthy that the reports, when compared against each other, not only provide inconsistent conclusions about SIT, but in some instances also conclude that no intervention has a high level of evidence-based support.

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In conclusion, an emerging body of evidence suggests that SIT is efficacious in treating children with ASD. Accordingly, the AOTA encourages the Treatment Intervention Advisory Committee to support funding for SIT. We appreciate this opportunity to provide research and information supporting sensory integration therapy to the TIAC. Please let us know if you have questions or need additional information. We look forward to discussing these issues with the TIAC on July 26.

Sincerely,



Florence Clark, PhD, OTR/L, FAOTA
President
American Occupational Therapy Association

cc: Teri Black, COTA, ROH
President
Wisconsin Occupational Therapy Association

Christina A. Metzler
Chief Public Affairs Officer
American Occupational Therapy Association

Attachments: Reference List
Table 1
Research Articles

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